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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,987	01/22/2007	Toshio Nagasaka	297122US0PCT	4623
22850 7590 11/23/2009 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER JONES JR., ROBERT STOCKTON				
ART UNIT 1796		PAPER NUMBER		
NOTIFICATION DATE 11/23/2009		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/594,987

**Applicant(s)**

NAGASAKA ET AL.

**Examiner**

ROBERT JONES JR.

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 September 2009 and 11 September 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

5           Claim 3 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

          Claim 3 places a limitation on the method used to evaluate the mass average  
10   particle diameter. This limitation does not in any way affect the composition or physical properties of the claimed composition; it merely attempts to limit the method by which those properties are measured. The courts have held that "a compound and all its properties are mutually inseparable", *In re Papesch*, 315F.2d 381, 137 USPQ 42, 51 (CCPA 1963). Thus, the claimed composition will inherently possess the claimed  
15   property regardless of the method used to measure said property. The method of measurement required by Claim 3 therefore does not place any limitation on the impact resistance modifier as claimed in Claim 1.

          For the purpose of examination, an impact resistance modifier as claimed in Claim 1 will be treated as also meeting the requirements of Claim 3.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- 5 (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10 The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

- 15 1. Determining the scope and contents of the prior art.  
2. Ascertaining the differences between the prior art and the claims at issue.  
3. Resolving the level of ordinary skill in the pertinent art.  
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

20 This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was  
25 not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugaya et al. (US Pat. No. 6,218,447, cited in previous action). Brandrup (Polymer Handbook, cited in applicant's IDS) is herein referred to for extrinsic evidence.

Regarding Claims 1-3, Sugaya teaches a resin composition comprising (A) 5 to 50% by weight of a graft copolymer having a multilayer structure and (B) 50 to 95% by weight of a methacrylic resin (col. 2, lines 6-10). Said graft copolymer is incorporated into methacrylic resins in order to improve impact resistance without impairing appearance, transparency, weatherability, gloss, and processability of the methacrylic resins (col. 1, line 64 – col. 2, line 1); therefore, the graft copolymer functions as an impact resistance modifier.

Said graft copolymer is prepared by:

(A-1) polymerizing a monomer mixture (X) comprising (a) an alkyl methacrylate having a C1 to C4 alkyl group and (b) at least one monomer selected from a group which includes alkyl acrylates having C1 to C12 alkyl groups in an (a)/(b) ratio of 40:60 to 100:0 by weight and (c) 0.01 to 10 parts by weight of a polyfunctional monomer, in the presence of (d) 0.01 to 2 parts by weight of a chain transfer agent to give an innermost layer of a crosslinked methacrylic polymer (I) (col. 2, lines 10-23);

(A-2) polymerizing a monomer mixture (Y) comprising (e) an alkyl acrylate having a C1 to C12 alkyl group and (f) at least one monomer selected from the group including an aromatic vinyl monomer in an (e)/(f) ratio of 60:40 to 100:0 and (g) 0.1 to 5 parts by weight of a polyfunctional monomer, in the presence of said crosslinked methacrylic

polymer (I), the (I)/(Y) ratio being 10:90 to 60:40, to give a rubber-like polymer (II) (col. 2, lines 24-35); and

(A-3) polymerizing a monomer component (Z) comprising (h) an alkyl methacrylate having a C1 to C4 alkyl group and (i) at least one monomer selected from the group including an alkyl acrylate having a C1 to C12 alkyl group in an (h)/(i) ratio of 60:40 to 100:0 in the presence of said rubber-like polymer (II), the (II)/(Z) ratio of said rubber-like polymer (II) to said monomer mixture (Z) being 60:40 to 90:10 by weight, to give multilayer graft copolymer (A) (col. 2, lines 36-45).

Section (A-3) constitutes the outermost layer of said graft copolymer. Monomers suggested for use as the alkyl methacrylate (h) include methyl methacrylate (MMA) (col. 5, lines 32-33; col. 3, lines 15-16), and MMA is utilized in Sugaya's examples (col. 10, Table 1). Monomers suggested for use as the alkyl acrylate (i) include butyl acrylate (BA) (col. 5, lines 33-36; col. 3, lines 23-28), and BA is utilized in Sugaya's examples (col. 10, Table 1). As discussed above, Sugaya teaches that the ratio of (h)/(i) is from 60:40 to 100:0; thus, one of ordinary skill in the art will at once envisage utilizing a MMA/BA ratio of from 60:40 to 100:0. Brandrup teaches that the T<sub>g</sub> of MMA is 378K (p. 219), and that the T<sub>g</sub> of BA is 219K (p. 215). According to the Fox equation (instant application, p. 5, paragraph 2), an outer layer comprising a 60:40 ratio of MMA/BA will have a T<sub>g</sub> of 292.9K (19.9°C), and an outer layer comprising a 100:0 ratio of MMA/BA will have a T<sub>g</sub> of 378K (105°C). Therefore, Sugaya teaches that the outer layer of said graft copolymer has a T<sub>g</sub> within the range of 19.9 to 105°C.

Sugaya teaches that the average particle size of said graft copolymer is preferably from 1000 to 4500 angstroms (col. 6, line 19), or 100-450 nm. Sugaya does not teach the average particle size for the copolymer formed up to the intermediate-layer polymer, nor the mass average particle diameter.

5           It would have been obvious to one of ordinary skill in the art at the time of the invention to form graft copolymers within the entire range of final particle size, as copolymers having these dimensions are directly contemplated by Sugaya.

          While the copolymer of Example 1 falls outside the required range for mass-average particle diameter for the copolymer formed up to the intermediate-layer  
10   polymer, copolymers at the lower end of Sugaya's preferred range of 100-450 nm will intrinsically possess values within the claimed range. This is demonstrated through the calculations discussed below:

          A range of mass average particle diameters for the intermediate-layer polymer can be calculated from data presented in Sugaya's Example 1 and measurements  
15   provided in the Applicant's declaration under 37 CFR 1.132 dated 11 September 2009. Example 1 teaches a copolymer having an intermediate diameter of 230 nm and a final diameter of 253 nm (col. 8, lines 1 and 13). Based on these measurements, it is reasonable to expect that the average particle size of the intermediate polymer is 91% of the final particle size. As stated above, the final average particle size enabled by  
20   Sugaya ranges from 100-450 nm. This is indicative of intermediate polymer average particle size ranging from 91-364 nm.

The Applicant's declaration provides a comparison between average particle size and mass average particle diameter. As stated above, Sugaya's Example 1 has an intermediate diameter of 230 nm. As shown by the Applicant, this is equivalent to a mass average particle diameter of 349 nm. Based on these measurements, it is  
5 reasonable to expect that the mass average particle diameter is 152% of the average particle size.

Relying upon the intermediate polymer average particle size of 91-364 nm and the relationship between average particle size and mass average particle diameter calculated above, one of ordinary skill in the art would reasonably expect that Sugaya's  
10 copolymers have a mass average particle diameter for the intermediate polymer ranging from 138.32-553.28 nm. This range wholly encompasses the claimed range of 200-300 nm. Although the copolymer presented in Sugaya's Example 1 does not fall within the claimed range, the range of particle size taught by Sugaya clearly includes copolymers which do possess the claimed mass average particle diameter.

15 Sugaya's graft copolymer therefore meets the compositional and physical requirements of Claims 1 and 3. Said resin composition comprising (A) 5 to 50% by weight of said graft copolymer and (B) 50 to 95% by weight of a methacrylic resin satisfies the requirements of Claim 2.



***Response to Amendment***

The declaration under 37 CFR 1.132 filed 09/11/2009 is sufficient to overcome the rejection of claims 1 and 2 under 35 U.S.C. 102(b) based upon the showing that the average particle size taught by Sugaya and the mass average particle diameter required by the instant claims differ and are therefore not interchangeable.

The terminal disclaimer filed 09/11/2009 is sufficient to overcome the provisional rejection of claims 1 and 2 on the ground of nonstatutory obviousness-type double patenting over copending Application No. 11/547,166.

***Response to Arguments***

Applicant's arguments, see particularly p. 4, paragraph 4, filed 09/02/2009, with respect to the rejection of claims 1 and 2 under 35 U.S.C. 102(b) have been fully considered and are persuasive. Sugaya teaches an average particle size, but fails to teach a mass average particle diameter for the polymer which has been made up to the intermediate-layer polymer. As evidenced by the Applicant's declaration filed 09/11/2009, these measured values differ from one another and are therefore not interchangeable.

Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground of rejection is made over Sugaya et al as presented above.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT JONES JR. whose telephone number is (571)270-7733. The examiner can normally be reached on Monday - Thursday, 9 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James J. Seidleck/  
Supervisory Patent Examiner, Art Unit 1796

RSJ